

WHAT IS CLAIMED IS:

1. A method of changing the visual appearance of a designated area of a data input device, the method comprising

providing a data input device with multiple visible areas, at least one of the areas comprising a designated area containing a field-stable electrophoretic ink; and

passing a field through only selected regions of the field-stable electrophoretic ink in the designated area to alter a visual characteristic of the ink in the selected regions to form a desired graphic label visible within the designated area.

2. The method of claim 1 wherein the designated area is an area of a digitizer input device.

3. The method of claim 2 wherein the designated area is a closed area surrounded by other areas of the digitizer and forms an adaptable button.

4. The method of claim 1 wherein the designated area is of an exposed surface of a manipulable keycap.

5. The method of claim 4 wherein the input device is a keypad, and wherein the keycap is manipulated by a user to depress the keycap relative to the keypad.

6. The method of claim 1 wherein the field is an electric field.

7. The method of claim 6 wherein the electric field is generated by electrically conductive elements within the device.

8. The method of claim 7 wherein the input device is a keypad, the designated area is of an exposed surface of a manipulable keycap of the keypad, and wherein at least one of the electrically conductive elements is disposed within the keycap.

9. The method of claim 7 wherein the electrically conductive elements comprise conductors shaped to form an intended graphic image.

5 10. The method of claim 7 wherein the electrically conductive elements comprise arrays of transistors.

11. The method of claim 1 wherein the field is passed through the ink by a printer placed in close proximity to the designated area.

10 12. The method of claim 11 wherein the input device is an assembled keypad and the printer is placed in close proximity to exposed surfaces of keycaps of the assembled keypad.

15 13. The method of claim 1 wherein the visual characteristic is altered as a function of subscriber services selected by a user.

14. The method of claim 13 wherein the visual characteristic is altered as a function of subscriber services selected with the data input device

20 15. The method of claim 1 wherein the visual characteristic is altered intermittently.

25 16. The method of claim 15 wherein the visual characteristic is altered intermittently to provide a series of graphics identifying third parties accessible by manipulating an input region of the device corresponding to the designated area.

17. The method of claim 1 further comprising sending a signal to the input device to trigger altering of the visual characteristic.

5 18. The method of claim 17 wherein the signal is sent from a remote location over a cellular or other wireless network or communication system.

19. The method of claim 18 wherein the signal provides data to identify both a series of graphics and key functions associated with each graphic.

10 20. The method of claim 17 wherein the signal activates a graphic already resident in memory within the device.

21. The method of claim 17 wherein the signal includes data describing a graphic previously unknown to the device.

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22. The method of claim 1 wherein the desired graphic label corresponds to a language-specific variant of an alphabetical character.

23. The method of claim 22 further comprising detecting manipulation of a specific key of the keypad and, in response to detecting said manipulation, replacing a first language-specific variation of an alphabetic character associated with an alphanumeric key last manipulated before the specific key was manipulated, with a second language-specific variation of an alphabetic character associated with an alphanumeric key.

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24. A data input device comprising
an input surface defining a designated input area; and

a sensor disposed beneath the designated input area and responsive by manipulation of the input surface by a user to register an input associated with the designated area;

wherein the designated input area contains a field-stable electrophoretic ink responsive to passing a field therethrough to alter a visual characteristic of the ink in selected regions to form a desired graphic label visible within the designated area.

25. The input device of claim 24 in the form of a digitizer.

26. The input device of claim 25 wherein the designated area is a closed area surrounded by other input areas of the digitizer and forms an adaptable button.

27. The input device of claim 24 wherein the designated input area is of an exposed surface of a manipulable keycap.

28. The input device of claim 27 in the form of a keypad, and wherein the keycap is manipulated by a user to depress the keycap relative to the keypad.

29. The input device of claim 24 wherein the ink is responsive to passing an electric field therethrough.

30. The input device of claim 29 further comprising electrically conductive elements disposed within the device and adapted to generate the electric field to alter the ink.

31. The input device of claim 30 in the form of a keypad with the designated area defined on an exposed surface of a manipulable keycap of the keypad, wherein at least one of the electrically conductive elements is disposed within the keycap.

32. The input device of claim 31 wherein the electrically conductive elements are disposed within the keycap and electrically isolated from each other and disposed to overlap in plan view, with each conductive element shaped to provide a different graphic image visible from the exposed key surface.

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33. The input device of claim 30 in the form of a keypad with the designated area defined on an exposed surface of a manipulable keycap of the keypad, and wherein the electrically conductive elements are disposed on a substrate beneath the keycap.

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34. The input device of claim 33 wherein the keycap is formed of a material that conducts electricity along a single axis.

35. The input device of claim 30 wherein the electrically conductive elements form an active matrix of transistors.

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36. The input device of claim 24 wherein the sensor comprises a capacitive array of conductive traces responsive to location of a finger above the designated area of the input surface.

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37. The input device of claim 24 in combination with a remote printer placed in close proximity to the designated area and adapted to generate and pass the field through the ink of the device.

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38. A method of changing the visual appearance of keys of a keypad, the method comprising

providing an assembled keypad with at least one key having an elevated, exposed key surface manipulable by a user to depress the key relative to the keypad, the key containing multiple electrically conductive elements electrically isolated from each other

and disposed to overlap in plan view, with each conductive element shaped to provide a different graphic image visible from the exposed key surface;

selecting from among the graphic images associated with the electrically conductive elements; and

5 passing an electric field through a selected conductive element in the key to form a desired graphic label visible at the exposed surface of the key.

39. A method of changing the visual appearance of a designated area of a data input device, the method comprising

10 placing the device adjacent a printer capable of generating a field; and

 passing a field from the printer through the designated area of the device to remove a previously applied graphic label from the designated area while forming a new graphic label visible within the designated area.

15 40. The method of claim 39 wherein the designated area of the device contains an electrophoretic ink responsive to the field applied by the printer.

41. The method of claim 40 wherein the ink is field-stable.

20 42. The method of claim 39 wherein the input device is an assembled keypad and wherein the printer is placed in close proximity to exposed surfaces of keycaps of the assembled keypad.

25 43. A method of altering format of previously entered text through a keypad, the method including

 detecting manipulation of a specific key of the keypad; and,

 in response to detecting manipulation, replacing a displayed, selected text with a differently formatted version of the selected text, according to a predetermined series of

formats through which the selected text is cycled upon multiple, sequential manipulations of the specific key.

5 44. The method of claim 43 wherein the series of formats includes underlined, bold and italicized.

 45. A method of altering information displayed on an operable, designated data input area of a portable electronic device, the method comprising
 providing a data input device with multiple data input areas having visible labels
10 associated with the input areas; and
 transmitting a signal to the input device from a remote location to alter the visible label of at least one of the data input areas of the device in response to the signal.

15 46. The method of claim 45 wherein the data input area of the altered label contains a field-stable electrophoretic ink, the signal causing a field to be passed through selected regions of the field-stable electrophoretic ink to alter a visual characteristic of the ink to alter the graphic label.

20 47. The method of claim 45 wherein the altered visible label contains one of advertisement, location, time or subscription-specific information.

 48. The method of claim 45 wherein the signal is transmitted to the input device over a cellular or other wireless network or communication system.

25 49. The method of claim 45 wherein the label is altered as a function of subscriber services selected by a user.

 50. The method of claim 45 further comprising, prior to transmitting said signal, receiving a label-triggering signal from the data input device.

51. The method of claim 45 wherein the label is altered intermittently.

52. The method of claim 51 wherein the label is altered intermittently to
5 provide a series of graphics identifying third parties accessible by manipulating the data
input area associated with the label.

53. The method of claim 45 wherein the transmitted signal provides data to
10 identify both a series of graphics and key functions associated with each graphic.

54. The method of claim 45 wherein the transmitted signal activates a graphic
already resident in memory within the device.

55. The method of claim 45 wherein the signal includes data describing a
15 graphic previously unknown to the device.

56. The method of claim 45 wherein the data input areas are exposed surfaces
of manipulable keycaps.

57. The method of claim 56 wherein the input device is a keypad, and wherein
20 the keycaps are manipulated by a user to depress the keycaps relative to the keypad.